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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Nobuo Ando

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3398

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EXAMINER

CANTELMO, GREGG

ART UNIT

PAPER NUMBER

1795

MAIL DATE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/540,907	<b>Applicant(s)</b> ANDO ET AL.	
	<b>Examiner</b> Gregg Cantelmo	<b>Art Unit</b> 1795	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12/4/09 AND 11/6/09.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 14-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 19 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 4, 2009 has been entered.

### ***Response to Amendment***

2. In response to the amendment received November 6, 2009, entered as per the RCE filed December 4, 2009:

- a. Claims 1-20 are pending with claims 14-18 withdrawn from consideration as to non-elected invention.
- b. The amendment to the specification has been entered.
- c. The prior art rejections to Ando and Ando '769, as respective primary references, stand.
- d. The remaining prior art rejections of record have been withdrawn in light of the amendment.

### ***Claim Objections***

3. Claim 19 is objected to because of the following informalities: the phrase "the lithium electrode is comprises" is grammatically incorrect . Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-2, 4, 6-10, 12-13 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,862,168 (Ando) in view of Murai and Ando '769.

Ando discloses a electrical storage device comprising: a positive electrode 1, a negative electrode 2, a lithium electrode 4 and an electrolyte capable of transferring lithium ions, wherein the lithium electrode 4 is arranged on an end with the negative electrode 2 (Fig. 1) and wherein lithium ions can be supplied to the negative electrode and/or the positive electrode by flowing current between the lithium electrode and the negative electrode and/or the positive electrode through an external circuit which connects the lithium electrode terminal with the negative electrode terminal and/or the positive electrode terminal. A positive electrode terminal is provided on the positive electrode, a negative electrode terminal is provided on the negative electrode, and a lithium electrode terminal is provided on the lithium electrode, the positive electrode terminal, the negative electrode terminal and the lithium electrode terminal include portions located at an outer portion of the electrical storage device. Each of the positive electrode, negative electrode and lithium electrode are provided on respective current collectors 1', 2' and 4', respectively (Figs. 6 as applied to claim 1).

It is apparent that the current collectors of Ando include protrusions as shown in Fig. 1. These current collectors are disclosed such that they can be directly welded to

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terminals without providing the conductor 5' (see col. 9, ll. 48-63). Therefore the protruding portions of the current collectors for the positive electrode, negative electrode and lithium electrode can be directly welded to a respective terminal where the terminal would extend to the outside of the battery casing (as applied to claim 1).

The electrolyte is an aprotic organic solvent solution of a lithium salt (abstract as applied to claim 2).

The lithium current collector is porous and has lithium deposited in the pores (col. 15, ll. 6-12 as applied to claim 4).

The bottom of the lithium electrode as shown in Figs. 3 and 5 is designed such that it faces the top portion of the positive and negative electrodes (as applied to claim 6).

The electrodes can be stacked in multiple layers as shown in Fig. 1 (as applied to claim 7) or can be rolled (Figs. 4-6 as applied to claim 8).

The device is a capacitor (abstract as applied to claim 9).

The electrodes are selected materials which reversibly carry lithium ions and/or anions and the electrostatic capacitance per unit weight of the negative electrode to the positive electrodes is at a ration of at least 3:1 (negative electrode to positive electrode) with the positive electrode having a larger weight than the negative electrode (see table 8 as applied to claim 10).

Regarding claim 12, claim 12 is held to define an operational condition applied to the device. It does not clearly further define the product apart from that disclosed in Ando and fails to define the conditions for supplying the lithium ions. Since the prior art

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apparatus is capable of supplying lithium ions to the electric storage device, the prior art is inherently capable having some amount of lithium remaining after lithium is supplied, depending on the conditions for supplying (as applied to claim 12).

The device is used in an electronic apparatus and thus teaches of the combination as recited in claim 13.

The lithium electrode comprises two plate electrodes about a common current collector 4' and is provided in the center of the rolled stack unit (Figs. 3 and 5 as applied to claim 19).

The lithium electrode and collector can alternatively be provided as a roll around the rolled electrode stack unit (Fig. 4 as applied to claim 20).

Ando does not teach of the lithium electrode being arranged to be out of direct contact with the negative electrode (claim 1) or of portions of respective terminals located outside the container and welded to respective protrusions of each current collector (claim 1), of the electrodes having pores in the current collectors (claim 3) or of the negative electrode material being an insoluble and infusible base having a polyacene-based structure with a H/C ratio of 0.50 to 0.05 (claim 11).

Regarding the lithium electrode being arranged to be out of direct contact with the negative electrode:

Murai teaches of a lithium ion cell wherein an auxiliary source of lithium is provided in the cell but is kept out of direct contact with the positive and negative electrodes (abstract and Figs. 1-3). Murai teaches that it is desired to keep the lithium metal out of direct contact with the electrodes or the electrolyte (abstract). This

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obviously prevents the formation of reaction products between the electrodes and electrolyte and the highly reactive lithium metal.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Ando by physically isolating the lithium metal source as suggested by Murai since it would have prevented for formation of a reaction compound between the anode and the highly reactive supplemental lithium and would have improved the capacity of the electrochemical device (para. 12).

In providing a configuration taught by Murai wherein a lithium supplemental source is provided in the lithium electrochemical device but not in contact with the electrodes or electrolyte inside the cell, it would further have been obvious then to provide terminals for all of the electrodes to include portions which are located outside of the container as taught by Murai in order to effectively provide the necessary supplemental lithium from the supplemental electrode 11 to the electrochemical electrodes of the lithium electrochemical device.

. Regarding the current collectors having protrusions which are welded to respective terminals:

Its is also recognized in the art to provide the current collectors in this configuration with protruding portions as taught by Ando '769 (Fig. 1). These current collectors are disclosed such that they can be directly welded to terminals without providing the conductor 5' (see col. 9, ll. 48-63). Therefore the protruding portions of the current collectors for the positive electrode, negative electrode and lithium electrode

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can be directly welded to a respective terminal where the terminal would extend to the outside of the battery casing (as applied to claim 1).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Ando by providing the current collectors with protruding portions and welding the protrusions with respective terminals as suggested by Ando '769 since it would have provided an equivalent configuration for moving current from the internal electrochemical cell components within the cell housing to the external load through respective cell housing terminals.

Regarding the formation of pores in the current collectors (claim 3):

Ando '769 discloses configuring the current collectors to have pores therein (see col. 2, ll. 47-61 and paragraph bridging columns 6 and 7).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Ando by forming pores in the current collectors as taught by Ando '769 since it would have provided a configuration which enables free transfer of lithium ions within the cell.

Regarding the negative electrode material of claim 11:

Ando '769 further teaches that such a material is an art-recognized negative electrode material in lithium ion devices (see col. 1, ll. 47-65 and col. 3, ll. 42-51).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Ando by modifying the negative electrode active material to that taught in Ando '769 since such materials are art-recognized materials for reversibly carrying lithium and since the particular material



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of Ando '769 can reversibly carry a greater amount of lithium and thus has a higher lithium capacity as compared to other materials. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ando in view of Murai and Ando '769 as applied to claim 1 above, and further in view of U.S. Patent No. 6,653,018 (Takahashi) or U.S. Patent No. 6,576,365 (Meitav).

The difference not yet discussed is of the housing being a laminate structure.

Laminate housings for lithium-based electrical storage devices are extremely well noted in the art as shown by Takahashi or Meitav (col. 4, ll. 27-37).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Ando by encasing the electric storage device in a laminate housing since such configurations are notoriously well known in the art and can provide a casing having sufficient moldability, heat-resistance, insulation, mechanical strength and sealability. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

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6. Claims 1-4 and 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. Ando '769 in view of JP 08-190934 (Honbou) or Murai.

Ando discloses a electrical storage device comprising: a positive electrode 1, a negative electrode 2, a lithium electrode 4 and an electrolyte capable of transferring lithium ions, wherein the lithium electrode 4 is arranged on an end with the negative electrode 2 (Fig. 1) and wherein lithium ions can be supplied to the negative electrode and/or the positive electrode by flowing current between the lithium electrode and the negative electrode and/or the positive electrode through an external circuit which connects the lithium electrode terminal with the negative electrode terminal and/or the positive electrode terminal. A positive electrode terminal is provided on the positive electrode, a negative electrode terminal is provided on the negative electrode, and a lithium electrode terminal is provided on the lithium electrode, the positive electrode terminal, the negative electrode terminal include portions located at an outer portion of the electrical storage device (Fig. 1 as applied to claim 1). It is also recognized in the art to provide the current collectors in this configuration with protruding portions as taught by Ando '769 (Fig. 1). These current collectors are disclosed such that they can be directly welded to terminals without providing the conductor 5' (see col. 9, ll. 48-63). Therefore the protruding portions of the current collectors for the positive electrode, negative electrode and lithium electrode can be directly welded to a respective terminal where the terminal would extend to the outside of the battery casing (as applied to claim 1).

The electrolyte is an aprotic organic solvent solution of a lithium salt (abstract as applied to claim 2).

Ando '769 discloses configuring the current collectors to have pores therein (see col. 2, ll. 47-61 and paragraph bridging columns 6 and 7 as applied to claim 3).

The lithium current collector is porous mesh or expanded metal and thus has pores (col. 9, ll. 10-20 as applied to claim 4).

The lithium electrode faces the negative electrode (see Figs. as applied to claim 6).

The electrodes can be stacked in multiple layers as shown in Fig. 1 (as applied to claim 7) or can be rolled (Figs. 7-8 as applied to claim 8).

The device is a capacitor (abstract as applied to claim 9).

Ando '769 further teaches that such a material is an art-recognized negative electrode material in lithium ion devices (see col. 1, ll. 47-65 and col. 3, ll. 42-51 as applied to claim 11).

Regarding claim 12, claim 12 is held to define an operational condition applied to the device. It does not clearly further define the product apart from that disclosed in Ando and fails to define the conditions for supplying the lithium ions. Since the prior art apparatus is capable of supplying lithium ions to the electric storage device, the prior art is inherently capable having some amount of lithium remaining after lithium is supplied, depending on the conditions for supplying (as applied to claim 12).

The device is used in an electronic apparatus and thus teaches of the combination as recited in claim 13.

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Ando '769 does not teach of portions of the terminals located outside the container (claim 1).

Regarding portions of the terminals being located outside of the container:

The concept of disposing the terminals outside a lithium cell is known in the art as shown by Honbou. The electrode terminals 34, 35 and the lithium terminal 36 are connected to an external circuit. Murai also teaches that the electrode terminals and lithium electrode can be designed such that the terminals extend to the outside of the lithium electrochemical device whereby the circuit for connecting the lithium electrode to the positive or negative electrodes of the cell. Such a configuration would have been readily obvious in light of the combination of teachings from the prior art and would have required only routine experimentation from one of ordinary skill in the art.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ando '769 in view of either Honbou or Murai as applied to claim 1 above, and further in view of U.S. Patent No. 6,653,018 (Takahashi) or U.S. Patent No. 6,576,365 (Meitav).

The difference not yet discussed is of the housing being a laminate structure.

Laminate housings for lithium-based electrical storage devices are extremely well noted in the art as shown by Takahashi or Meitav (col. 4, ll. 27-37).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Ando '769 by encasing the electric storage device in a laminate housing since such configurations are notoriously well known in the art and can provide a casing having sufficient moldability, heat-resistance, insulation, mechanical strength and sealability. The selection of a known

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material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

### ***Response to Arguments***

8. Applicant's arguments filed November 6, 2009 have been fully considered but they are not persuasive.

Applicant argues that amended independent claim 1 claims a positive electrode terminal that is welded to a protrusion of the positive electrode collector, a negative electrode terminal that is welded to a protrusion of the negative electrode collector provided on the negative electrode, and a lithium electrode terminal is that is welded to a protrusion of the lithium electrode collector. Applicants respectfully submit that this claimed feature is neither disclosed or suggested by Ando '168 or Ando '769, or by any of the other cited references, and that the Graham requirements for finding amended independent claim 1 to be obvious are not met. See, e.g., MPEP § 2143(A).

The Examiner respectfully disagrees.

First, Applicant's argument is not persuasive since it merely states that the prior art does not disclose or suggest such features without any rationale to support Applicant's assertion.

Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically

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pointing out how the language of the claims patentably distinguishes them from the references.

In the absence of any convincing evidence to support Applicant's allegation, this position cannot be persuasive.

Furthermore such cannot be found persuasive when it still appears that the teachings of Ando and Ando '769 still teach the features which Applicant alleges are not taught by either of these references or the remaining prior art of record.

Therefore, for at least these reasons, the rejections stand.

### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:30-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregg Cantelmo/  
Primary Examiner, Art Unit 1795